Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

Claim 1 (Currently Amended): A failure analysis method using an original fail bit map that is prepared, based on the data about the position of a failure memory cell having inferior electrical characteristic in a plurality of memory cells arranged in matrix form, by associating said failure memory cell with a fail bit in bit units, and mapping to the arrangement of said memory cells, said failure analysis method comprising the steps of:

(a) preparing various compressed fail bit maps from said original fail bit map; and

(b) calculating fail rates of said respective compressed fail bit maps and distinguishing a fail shape based on said fail rates, wherein

said step of preparing compressed fail bit maps comprises:

dividing said original fail bit map based into a plurality of compression areas having different sizes to convert into various forms in each of which a plurality of pixels of equal size are arranged ~~to said~~ in their respective compression areas; and

regarding said pixels containing said fail bit, as a failed pixel, and

said fail rates being defined by the ratio of said fail pixel in a predetermined region.

Claim 2 (Original): The failure analysis method according to claim 1 wherein said step (b) includes the steps of:

(b-1) by using as a reference fail rate said fail rate about one of said compressed fail bit maps, estimating a fail shape at least by collating a predetermined fail rate for distinguishing a fail shape with said reference fail rate;

(b-2) obtaining index values for fail shape judgement by standardizing said fail rates of the rest of said compressed fail bit maps by using said reference fail rate as a denominator; and

(b-3) collating said index values with a predetermined fail shape judgement rule to obtain a result, and distinguishing a fail shape based on said result and the result of the fail shape estimation in said step (b-1).

Claim 3 (Original): The failure analysis method according to claim 2 wherein,

said step (b) includes the step of judging whether said fail pixel in said predetermined region is adjacent to said fail pixel in a region other than said predetermined region, and

said step (b-1) performs a fail shape estimation based on the result of the collation between said predetermined fail rate and said reference fail rate, and the result of said judging step.

Claim 4 (Currently Amended): A failure analysis method using an original fail bit map that is prepared, based on the data about the position of a failure memory cell having inferior electrical characteristic in a plurality of memory cells arranged in matrix form, by associating said failure memory cell with a fail bit in bit units, and mapping to the arrangement of said memory cells, said failure analysis method comprising the steps of:

(a) preparing various compressed fail bit maps from said original fail bit map; and

(b) calculating fail rates of said respective compressed fail bit maps and distinguishing a fail shape based on said fail rates, wherein

said step of preparing various compressed fail bit maps comprises the following steps:

dividing said original fail bit map based on a predetermined compression area ~~to convert into such a form that a plurality of pixels of equal size to said compression areas~~ to

convert into various forms that a plurality of pixels of equal size are arranged in their respective compression areas;

judging whether said pixels are failed based on each of a plurality of compression thresholds defining the number of said fail bits in said pixels, and

regarding said pixels containing a number of said fail bits corresponding to their respective compression thresholds as a failed pixel, and

said fail rates being defined by the ratio of said fail pixel in a predetermined region.

Claim 5 (Original): The failure analysis method according to claim 4 wherein said step (b) includes the steps of:

(b-1) by using as a reference fail rate said fail rate about one of said compressed fail bit maps, estimating a fail shape by collating at least a predetermined fail rate for distinguishing a fail shape with said reference fail rate;

(b-2) obtaining index values for fail shape judgement by standardizing said fail rates of the rest of said compressed fail bit maps by using said reference fail rate as a denominator; and

(b-3) collating said index values with a predetermined fail shape judgement rule to obtain a result, and distinguishing a fail shape based on said result and the result of the fail shape estimation in said step (b-1).

Claim 6 (Original): The failure analysis method according to claim 5 wherein,

said step (b) includes the step of judging whether said fail pixel in said predetermined region is adjacent to said fail pixel in a region other than said predetermined region, and

said step (b-1) performs a fail shape estimation based on the result of the collation between said predetermined fail rate and said reference fail rate, and the result of said judging step.

Claim 7 (Currently Amended): A failure analysis method using an original fail bit map that is prepared, based on the data about the position of a failure memory cell having inferior electrical characteristic in a plurality of memory cells arranged in matrix form, by associating said failure memory cell with a fail bit in bit units, and mapping to the arrangement of said memory cells, said failure analysis method comprising the steps of:

(a) preparing various compressed fail bit maps from said original fail bit map; and

(b) calculating fail rates of said respective compressed fail bit maps and distinguishing a fail shape based on said fail rates, wherein

said step of preparing various compressed fail bit maps comprises the following steps:

dividing said original fail bit map based on each of a plurality of compression areas having different size to convert into various forms in each of which a plurality of pixels of equal size are arranged ~~to said~~ in their respective compression areas;

defining the number of said fail bits in said pixel based on each of a plurality of compression thresholds, and

regarding said pixels containing not less than a predetermined number of said fail bits corresponding to their respective compression thresholds, as a fail pixel, and said fail rates being defined by the ratio of said fail pixel in a predetermined region.

Claim 8 (Original): The failure analysis method according to claim 7 wherein said step (b) includes the steps of:

(b-1) by using as a reference fail rate said fail rate about one of said compressed fail bit maps, estimating a fail shape by collating at least a preset predetermined fail rate for distinguishing a fail shape with said reference fail rate;

(b-2) obtaining index values for fail shape judgement by standardizing said fail rates of the rest of said compressed fail bit maps by using said reference fail rate as a denominator; and

(b-3) collating said index values with a predetermined fail shape judgement rule to obtain a result, and distinguishing a fail shape based on said result and the result of the fail shape estimation in said step (b-1).

Claim 9 (Original): The failure analysis method according to claim 8 wherein,

said step (b) includes the step of judging whether said fail pixel in said predetermined region is adjacent to said fail pixel in a region other than said predetermined region, and

said step (b-1) performs a fail shape estimation based on the result of the collation between said predetermined fail rate and said reference fail rate, and the result of said judging step.

Claim 10 (Previously Presented): A computer readable recording medium comprising instructions that allow a computer to execute a failure analysis method according to claim 1.

Claim 11 (Previously Presented): A computer readable recording medium comprising instructions that allow a computer to execute a failure analysis method according to claim 4.

Claim 12 (Previously Presented): A computer readable recording medium comprising instructions that allow a computer to execute a failure analysis method according to claim 7.

Claims 13-35 (Cancelled)